inactivated by mutation of their targeted enzymes. So, new alternatives for class A inhibitors and novel active compounds for class B, C and D lactamases are in urgent demands. We have designed and synthesized several new sets of libraries for finding potent drug candidates as novel lactamase inhibitors. The libraries include cysteinyl peptide, thiol and thioester inhibitors for class B enzyme, and also some promising wide-spectrum inhibitors which taget both class A and class B or class C beta-lactamase enzymes.

MEDI 203

Penicillin bound nanoparticles: A promising new way to save old antibiotics

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Beta-lactam antibiotics are currently mainstays of clinical treatment for bacterial infections, a position which is secure for the foreseeable future. However, their effectiveness has been compromised by the ability of drug-resistant bacteria to produce beta-lactamases, enzymes which hydrolyze the beta-lactam moiety in these antibiotics to render them inactive. We describe an approach using penicillin-bound nanoparticles to rejuvenate the activity of these important, life-saving antibiotics to make them effective again against drug-resistant bacteria.

MEDI 204

Reviving the clinical efficacy of kanamycin-B: Design and synthesis of novel kanamycin analogs and studies of their antibacterial activity against aminoglycoside resistant bacteria

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Amioglycoside antibiotics bearing the central aminocyclitol moiety have long been in vogue because of their potent bactericidal activity towards both gram positive and gram negative bacteria. However, of late a number of staphylococci and enterococci have shown an alarming rate of resistance to aminoglycoisde antibiotics.

The history of Kanamycin dates back to 1957 when it was first isolated, but the same compound was rendered clinically obsolete thanks, to the aminoglycoside modifying enzymes which these bacteria harbor. We have been trying to revive the clinical utility of this drug by introducing modification on the neamine moiety. Four Novel Kanamycin-B analogs with activity against aminoglycoside modifying enzymes have been synthesized. We would like to present the design, synthesis,and antibacterial activity of these compounds.

MEDI 205

Design and synthesis of novel aminoglycosides and their antibacterial studies against aminoglycoside resistant bacteria

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Aminoglycoside antibiotics have long been used as bactericidal drugs. Unlike many antibiotics that are active only against gram positive bacteria, aminoglycosides have broad spectrum activity against both gram positive and negative bacteria. Their history dates back to 1943 when the first aminoglycoside Streptomcin was isolated, unfortunately their clinical usage has often been limited due to the widespread prevalence of aminoglycoside modifying enzymes and their high cytotoxicity. Kanamycin a potent drug was rendered clinically obsolete thanks to these modifying enzymes. This seminar will focus on the types and modes of action of these modifying enzymes, the various strategies to overcome this problem and our work in the synthesis of 3' – 4' Dideoxy pyranmycin and kanamycin compounds in an attempt to revive the activity of these aminoglycosides against the resistant bacteria.

MEDI 206

Isolation, characterization, and enhanced antibacterial activity of components from *Lomatium californicum*

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The isolation, characterization, and bioactivity testing of five compounds from the ethyl acetate and hexanes layers from *Lomatium californicum* is described. The methanolic extract of the seeds and roots of *L. californicum* was subjected to liquid/liquid partitioning, vacuum liquid chromatography, and separation by reverse phase HPLC. Five compounds were successfully isolated and characterized by 1D and 2D NMR experimentation. The bioactivity of the known compounds falcarindiol, coniferyl ferulate, ferulic acid, and (Z)-ligustilide were confirmed against *Bacillus subtilis* and *Staphylococcus aureus*. Moreover, these compounds exhibited antibacterial enhancement when combined with the antibiotics penicillin and ampicillin. The compound senkyunolide was also isolated but in too small of quantity for similar testing.

MEDI 207

Synthesis, biological activity, and X-ray crystal structural analysis of diaryl ether inhibitors of malarial enoyl acyl carrier protein reductase: 2'- and 4'-Substituted triclosan derivatives

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